

Supreme Court, U. S.

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## IN THE

# Supreme Court of the United States

## OCTOBER TERM, 1996

**UNITED STATES OF AMERICA, PETITIONER**

10

**AIRMAN EDWARD G. SCHEFFER, RESPONDENT**

*ON WRIT OF CERTIORARI  
TO THE UNITED STATES COURT OF APPEALS  
FOR THE ARMED FORCES*

## **SUPPLEMENTAL BRIEF FOR THE RESPONDENT**

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## **QUESTION PRESENTED**

Whether Military Rule of Evidence 707, which provides that evidence of a polygraph examination is not admissible in court-martial proceedings, is an unconstitutional abridgement of military defendants' right to present a defense.

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## SUPPLEMENTAL ARGUMENT

On 30 September 1997, the United States Court of Appeals for the Armed Forces decided the case of *United States v. Bush*, *\_ MJ No. 96-1239* (CAAF 30 September 1997) (Appendix). In this case, the United States Court of Appeals for the Armed Forces upholds the United States Air Force's prosecution of Staff Sergeant Bush based on scientific evidence of drug use from mass-spectrometry hair analysis. Slip Op. at 12.

Our research revealed only one other case—an Army court-martial—in which such scientific hair analysis was used in a prosecution for drug offenses. See *United States v. Nimmer*, 43 MJ 252 (1995) (setting aside decision of the United States Army Court of Criminal Appeals and remanding the case for hearing of admissibility of hair-analysis in light of *Daubert v Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993)); see also *United States v. Medina*, 749 F.Supp. 59, 60 (E.D.N.Y. 1990) (noting radioimmunoassay hair analysis is a "relatively new form of forensic proof not yet recognized by the courts"); *Bush*, Slip Op. at 22.<sup>1</sup> The *Bush* case demonstrates that the United States Air Force is on the leading edge of prosecuting military members by using new and complex scientific evidence, despite the procedural complexities involved in presenting such evidence.

WHEREFORE, the decision of the United States Court of Appeals for the Armed Forces should be affirmed.

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<sup>1</sup>Hair analysis has been proffered as evidence of drug use in settings other than criminal prosecutions. *United States v. Medina*, 749 F.Supp.59 (E.D.N.Y. 1990) (parole revocation hearing); *Nevada Employment Sec. Dept. v. Holmes*, 112 Nev. 275, 914 P2d 611 (Nev 1996) (disqualification for unemployment benefits); *Matter of Adoption of Baby Boy L.*, 157 Misc.2d 353, 596 N.Y.S.2d 997 (N.Y.Fam.Ct. 1997) (adoption hearing); and *Hicks v. City of New York*, 172 Misc.2d 994, 660 N.Y.S.2d 953 (N.Y.sup. 1997) (discharge from employment as new York City police officer).

Respectfully submitted,

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## APPENDIX

October 1997

**Appendix**

United States, Appellee

v.

Michael W. BUSH, Staff Sergeant  
U.S. Air Force, Appellant

No. 96-1239

Crim. App. No. 31462

United States Court of Appeals for the Armed Forces

Argued May 14, 1997

Decided September 30, 1997

*Counsel*

For Appellant: *Major Kevin P. Koehler* (argued) and  
*Lieutenant Colonel Kim L. Sheffield* (on brief); *Colonel David W. Madsen*.

For Appellee: *Lieutenant Colonel Michael J. Breslin* (argued);  
*Colonel Theodore J. Fink* (on brief).

Military Judge: *William S. Colwell*

*Opinion of the Court*

SULLIVAN, Judge:

During July of 1994, appellant was tried by a general court-martial composed of officer members at Andrews Air Force Base, Maryland. Contrary to his pleas, he was found guilty of dereliction of duty by failure to provide a urine sample; and wrongfully using cocaine, in violation of Articles 92 and 112a, Uniform Code of Military Justice, 10 USC

§§ 892 and 912a, respectively. He was sentenced to a bad-conduct discharge, 45 days' confinement, and reduction in rank to E-1. On January 13, 1995, the convening authority approved the sentence. On June 13, 1996, the Court of Criminal Appeals affirmed. 44 MJ 646.

On January 9, 1997, this Court granted review on the following questions of law:

## I

WHETHER THE MILITARY JUDGE ERRED TO THE SUBSTANTIAL PREJUDICE OF APPELLANT BY DENYING THE DEFENSE MOTION TO SUPPRESS EVIDENCE OBTAINED AS A RESULT OF AN IMPROPER SEIZURE OF APPELLANT'S HAIR, SINCE OMISSION OF INFORMATION FROM THE AFFIDAVIT TO THE MAGISTRATE UNDERMINED THE MAGISTRATE'S FINDING OF PROBABLE CAUSE TO SEIZE THE HAIR.

## II

WHETHER THE MILITARY JUDGE ERRED TO THE SUBSTANTIAL PREJUDICE OF APPELLANT BY DENYING THE DEFENSE MOTION TO DISALLOW INTRODUCTION OF TESTIMONY CONCERNING THE RESULTS OF THE HAIR ANALYSIS TEST CONDUCTED ON APPELLANT'S HAIR, SINCE THE TEST WAS NOT A RELIABLE PROCEDURE AS IMPLEMENTED.

We hold that the military judge did not legally err by admitting hair-analysis evidence in this case. *See generally* *Ornelas v. United States*, \_\_\_ U.S. \_\_, 116 S.Ct. 1657 (1996); and *United States v. Nimmer*, 43 MJ 252 (1995).

The Court of Criminal Appeals found the following facts pertinent to this appeal:

On November 15, 1993, appellant was selected to provide a sample for a random drug urinalysis. He showed up at the base theater, as he was directed to do. Thereafter, accompanied by Technical Sergeant (TSgt) Robichaud, the observer, appellant took the sample bottle to the men's room to provide a specimen. A number of irregularities, the significance of which was not then appreciated, ensured. Appellant elected to use a stall, rather than a urinal, complicating Robichaud's observation. He continued to wear his field jacket, and had to be directed by Robichaud to turn slightly so that Robichaud could see him urinate. Even then, as Robichaud later admitted, appellant was positioned in such a way that he did not actually see if appellant urinated, but only that liquid appeared to be filling the bottle. Robichaud, and subsequently the urinalysis monitor, remarked on the clarity of the specimen. However, when asked, appellant explained that he had been drinking a great deal of fluid, and the matter passed. The specimen bottle, which had not left appellant's possession from the time he was given it until he gave it back to the urinalysis monitor, was duly logged, initialed, signed, taped, secured, and mailed to the Armstrong Laboratory at Brooks Air Force Base (AFB) for testing. Once there, one of the laboratory technicians observed that the specimen was colorless, odorless, and did not foam when shaken.

She suspected that a false or adulterated sample had been provided. When a field test

indicated that the specimen was not urine, she sent it to Wilford Hall Medical Center, which confirmed that the specimen was not urine, but some sort of saline solution.

Over defense objection, the government introduced evidence that appellant, a medical technician assigned to the Malcolm Grow Medical Center on Andrews Air Force Base (AFB), had access to intravenous bags containing saline solution, along with surgical tubing and a thumbscrew to control flow from the bags. As well, testimony indicated that appellant was capable of reverse selfcatheterizing, replacing the urine in his bladder with a saline solution. Regardless of the specific mechanism employed, it is clear that appellant did not provide a genuine urine specimen as he was required to do.

On learning of the discrepancy in early December, the base looked into the possibility of testing appellant's hair for the presence of drugs. Special Agent (SA) Toni, of the Air Force Office of Special Investigations (AFOSI), contacted the FBI's forensics laboratory, and was advised that the technology existed to test hair based upon the same biomedical and scientific principles as urinalysis. The advantage, he learned, was that hair potentially would continue to show the presence of cocaine for a period of months after ingestion. The FBI agreed to perform the tests. Using an example borrowed for the AFOSI at Langley AFB, Virginia, SA Toni then prepared an affidavit, stating in pertinent part as follows:

4. . . . As a result of your affiant's training and information gathered from the Federal

Bureau of Investigation (FBI) forensics laboratory, and the Brooks AFB forensics laboratory, your affiant believes trace amounts of drugs may be trapped in the cortex of BUSH's hair [sic] follicles and in his urine. This is based on the following:

a. As blood circulates through the body, it nourishes the hair follicle. If there are drugs in the blood, trace amounts of the drug become entrapped in the core of the hair in amounts roughly proportional to those ingested. These cannot be washed or flushed out, and do not diminish with time. Urine tests can only determine if drugs have been used within the few days prior to providing a sample, however, hair analysis can detect the use of drugs for months, depending on the length of the hair sample.

b. Hair analysis is not subject to false negatives due to temporary abstention or excessive fluid intake. Hair records drug use in a chronological manner and in proportion to the amount consumed. The FBI laboratory can distinguish between heavy, medium, and light drug users.

5. If drug metabolites are present in BUSH's hairs, at a level in excess of 3 ng/mg of hair, it would indicate repeated use of drugs.

6. Based on all the information provided above, your affiant requests authorization to seize approximately 100 hairs and a urine sample from the body of SSgt MICHAEL W. BUSH.

The search authority, Colonel Moore, swore SA Toni to the affidavit and granted authority to seize "approximately, 100 hairs," but did not authorize seizure of appellant's urine. Pursuant to that authority, approximately 100 hairs were cut from the crown of appellant's head. Although never precisely measured, there was a general consensus that appellant's hair was "quite short," and that the hairs measured approximately  $\frac{1}{2}$  inch in length. Observing the same chain of custody procedures employed in urinalysis drug testing, the hairs were placed into a bottle, sealed, and sent to the FBI laboratory. By letter of February 28, 1994, the FBI reported that the specimens contained "cocaine and its metabolite, benzoylecgonine at concentrations of 17 and 2.7 nanograms per milligram of hair, respectively."<sup>2</sup>

Based upon this evidence, a general court-martial consisting of members convicted appellant, contrary to his pleas, of dereliction of duty for failure to provide a urine specimen on November 15, 1993, and use of cocaine between on or about November 15, 1993, and January 12, 1994. . . .

\* \* \*

44 MJ at 647-48 (footnote omitted).

<sup>2</sup>Unlike urinalysis, where principally metabolized cocaine (benzoylecgonine) is excreted in urine, unmetabolized cocaine is typically found in hair in five times the amount of its metabolite. According to the testimony of Dr. Donnelly, the government's expert, the 5-1 ratio is typical of actual ingestion, and indeed, "almost precludes any possibility of external contamination." External contamination would yield a much higher ratio. This datum proved significant in the trial itself, as appellant repeatedly suggested that the hair sample might have become contaminated through some kind of passive exposure.

The first question in this case is whether the military judge erroneously denied the defense motion to suppress the Government's evidence of hair analysis because the tested hair was unlawfully seized from appellant. *See generally* Mil.R.Evid. 311(a), Manual for Courts-Martial, United States, 1984. Appellant initially asserts that his hair at the time of its seizure was too short to show drug use at the time he was suspected of using it. Accordingly, he argues that neither the investigating AFOSI agent nor the commander ordering the seizure of his hair could possibly have probable cause to believe evidence of that drug use would still be in his hair. *See generally United States v. Poole*, 30 MJ 271, 275 (CMA 1990) (probable cause may evaporate with the passage of time). He also asserts that the commander who ordered his hair seized on January 12, 1994, was deliberately or recklessly denied material information that would have dissuaded him from ordering that probable-cause seizure. *See generally Franks v. Delaware*, 438 U.S. 154 (1978). He contends that the investigating officer should have particularly informed the commander that his hair's length as of January 12th, the date of the expected seizure, was scientifically insufficient to determine cocaine use on or about November 15, 1993.

Initially, we note that the record does not support appellant's assertion that probable cause had evaporated because his hair was only  $\frac{1}{2}$ -inch long on January 12, 1994. In fact, the agent testified that he did not know "exactly how long" appellant's head hair or pubic hair was on January 12, 1994. He estimated that "[i]t would have been at least a half inch. It was probably a half inch to an inch" at the time it was seized. The fact that the hair sample seized was  $\frac{1}{2}$ -inch long does not undermine the investigator's and the commander's practical judgment that a relevant hair sample could still be seized from appellant. *See generally Ornelas*, \_\_ U.S. at \_\_,

116 S.Ct. at 1661 (probable cause is not a legally technical determination but a practicable one).

The initial premise of appellant's second argument is that the investigating police officer was fully aware of the scientific principles upon which hair analysis was based but "deliberately or recklessly" failed to explain those principles to the commander. In addition, he notes that the police investigator did not tell the commander that hair grows  $\frac{1}{2}$  inch per month and at least 1-inch hair would be required on January 12, 1994, to determine whether appellant used drugs on or about November 15, 1993. He notes further that the police investigator failed to inform the commander that appellant's hair on January 12, 1994, was only  $\frac{1}{2}$ -inch long and would only show drug use on or after December 12, 1993. He contends deliberate deception or reckless disregard for the truth existed in this case, not mere negligence. *See Franks, supra* at 170.

We note that the investigating officer in his supporting affidavit did provide a basic explanation of the scientific principles of hair analysis to the commander. Moreover, he specifically advised the commander:

Urine tests can only determine if drugs have been used within the few days prior to providing a sample, however, hair analysis can detect the use of drugs for months, depending on the length of the hair sample.

Finally, although he admitted that he was aware of the  $\frac{1}{2}$ -inch rule at the time of applying for the search authorization, he asserted that he understood that the hair sample could be taken from the head, pubic area, or other part of the body. In this context, appellant's deliberate-or-reckless-omission argument is not well taken. *See generally United States v. Figueroa*, 35 MJ 54, 57 (CMA 1992); *United States v. Colkley*, 899 F.2d 297, 301 (4th Cir. 1990).

This is not a case in which the probable-cause determination required precise mathematical measurements implementing a specific scientific formula. As noted in the findings of fact by the military judge, Agent Toni's guidance from the FBI was rather general in nature:

The FBI instructed Agent Toni to obtain the longest hair possible, to cut the hair at the base of the scalp. Agent Toni was not told to obtain a certain or minimum length of hair. The FBI told Agent Toni that hair grows approximately one half inch per month and that drugs could possibly remain in the hair for a period as long as three months, depending on the length of hair sample seized and the growth rate.

Moreover, according to the findings of fact by the military judge, after Agent Toni obtained the search warrant—

Agent Toni subsequently seized about 100 hair samples from the scalp of the accused. The hair was difficult to measure and a measure was not taken after it was cut, because the hair was matted and curly. To the best estimate of Agent Toni, the hair was at least one half inch long to about an inch.

Under these circumstances and in light of the circumstances surrounding the urinalysis which gave rise to the request for a search authorization, it was reasonable for Agent Toni to proceed under the search authorization without applying a precise mathematical limitation to the length of the hair obtained from appellant.

## II

Appellant's basic argument on the second granted issue is that evidence of mass-spectrometry hair analysis was unlawfully admitted at his court-martial to establish his guilt

of using cocaine. Citing the decision of the Navy-Marine Corps Court of Military Review\* in *United States v. Nimmer*, 39 MJ 924 (1994), he argues in his 1997 Final Brief to this Court at 17-18, 24, that such evidence is *per se* inadmissible under Mil.R.Evid. 702. Citing the decision of the Army Court of Criminal Appeals in *United States v. Hill*, 41 MJ 596 (1994), he contends such evidence is not admissible as the sole proof of drug use at a court-martial. Finally, citing the landmark decision of the Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993), he avers that the military judge abused his discretion in admitting this evidence for the first time in any court in our country.

Appellant first asserts that this Court should decide the question of admissibility of hair-analysis evidence “*de novo*” and ensure “uniform precedent within the federal system regarding the reliability of particular scientific techniques . . . .” Final Brief at 18. He also cites the *Nimmer* decision of the Navy-Marine Corps Court of Military Review and implies that we should follow that court’s rejection of hair-analysis evidence (“it lacks the necessary scientific underpinning to reliably be able to detect a one-time use of cocaine . . . .” 39 MJ at 928). Final Brief at 17-18. We reject appellant’s invitation to establish a *per se* rule precluding admission of evidence of hair analysis at courts-martial.

The obvious answer to appellant’s argument in his 1997 brief is the decision of this Court in *United States v. Nimmer*, 43 MJ 252 (1995). There, this Court set aside the decision of the service appellate court in *Nimmer* and remanded that case for a hearing on admissibility of hair-analysis testimony in light of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, *supra*. The *Nimmer* decision relied on by appellant, therefore, has no precedential value, so there is no reason to follow it in this

case, especially where a proper *Daubert*-type hearing has been held. In addition, we note that Congress has not provided that this Court make “*de novo*” admissibility determinations on different types of scientific evidence without regard for evidence of record and a military judge’s ruling under Mil.R.Evid. 702. See *United States v. Beasley*, 102 F.3d 1440, 1445 (8th Cir. 1996) (Absent judicial notice of reliability of scientific knowledge, *Daubert* hearing will be held.).

We next turn to appellant’s argument that hair-analysis evidence is inadmissible if it is used as the sole test to determine cocaine use. Appellant notes evidence in the record that the scientific community only considers hair analysis reliable to corroborate or confirm other evidence of cocaine use. He then cites the Army Court of Criminal Appeals decision in *United States v. Hill*, *supra*, as generally holding that confirmatory testing evidence is inadmissible at courts-martial if no other evidence shows drug use. Finally, he avers that no other evidence of drug use was admitted in his case and, therefore, the military judge legally erred in admitting the hair-analysis evidence of the Government.

We reject this legal argument for several reasons. First, the Army Court of Criminal Appeals in *United States v. Hill*, *supra*, addressed the particular question of admissibility of luminol testing to detect human blood, not hair analysis to detect cocaine or its metabolites. The evidence supporting admission of hair-analysis evidence presented in this case was not before that court, so its decision cannot be considered dispositive of this different question of law. Second, appellant has cited no statute, evidentiary rule, or case law which requires a court to defer to the scientific community’s labeling of a test as “confirmatory.” We agree with the military judge that Mil.R.Evid. 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, *supra*, give a military judge broad discretion to regulate admission of scientific evidence at

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\*See 41 MJ 213, 229 n.\* (1994).

courts-martial with due regard for the advisory opinions of the scientific community. *See United States v. Gipson*, 24 MJ 246, 252 (CMA 1987). Finally, we agree with the Court of Criminal Appeals in this case that other evidence of drug use was admitted which the hair-analysis evidence corroborated. In particular, the appellate court below noted that evidence was admitted that appellant surreptitiously substituted a saline solution for a urine sample on November 15, 1993. *See generally* 2 Wigmore, *Evidence* § 276 (Chadbourn rev. 1979).

Appellant finally attacks the decision of the military judge admitting the hair-analysis evidence as an abuse of his discretion provided in Mil.R.Evid. 702. *See generally* *United States v. Houser*, 36 MJ 392, 397 (CMA 1993) (to establish abuse of discretion, "appellant must come 'forward with conclusive argument'"). He contends that proper application of the *Daubert* factors to the evidence in his case would lead to the conclusion that hair-analysis evidence is unreliable and inadmissible. These arguments are essentially the same arguments presented to the military judge at trial to prevent admission of the challenged evidence.

The Eighth Circuit in *Beasley*, 102 F.3d at 1447, recently commented on this type of appellate argument:

In this appeal, Oliver Beasley reasserts his claim that PCR testing does not meet the *Daubert* standard of reliability. He fails, however, to support this claim with any fact-based arguments designed to convince us that any of the District Court's findings concerning the reliability of PCR testing are clearly erroneous. Moreover, he does not contend (nor could he plausibly do so) that the District Court failed to follow the method that *Daubert* prescribes for the judicial assessment of the admissibility of scientific evidence. Instead, in his brief he merely incorporates by reference the

arguments found in his trial counsel's memorandum in support of the motion to exclude the government's DNA evidence. We reject these arguments. First, they are not properly before us; a litigant cannot make arguments on appeal by incorporating by reference into his appellate brief arguments made in written submissions to the trial court. *See* 8th Cir. R. 28A(j); *Sidebottom v. Delo*, 46 F.3d 744, 750 n.3 (8th Cir.), *cert. denied*, \_\_\_ U.S. \_\_\_, 116 S.Ct. 144, 133 L.Ed.2d 90 (1995). Second, even if these arguments were properly before us, they are not geared to the standard of review, the clear-error standard, that governs our consideration of alleged errors in the trial court's fact-finding. *See* Fed.R.Civ.P. 52(a); *Anderson v. City of Bessemer City*, 470 U.S. 564, 573-75, 105 S.Ct. 1504, 1511-12, 84 L.Ed.2d 518 (1985). These arguments thus would be of no assistance to Beasley in persuading us that the District Court's reliability finding regarding the science of PCR testing is clearly erroneous. . . .

We generally agree with the Eighth Circuit that an appellate court of law is not an appropriate place to relitigate a motion to admit expert testimony under Mil.R.Evid. 702. Therefore, we again reject appellant's invitation to determine *de novo* the reliability of the hair analysis admitted by the judge in this case. *See United States v. St. Jean*, 45 MJ 435, 444 (1996) (recognizing abuse-of-discretion standard). As noted by the First Circuit in *United States v. Gonzalez-Maldonado*, 115 F.3d 9, 15 (1997), a judge's decision on admissibility "is entitled to great deference" and an appellate court "will reverse . . . [his] decision on this question only if (1) the . . . [trial judge] based the decision on an incorrect legal standard, or (2) we have a definite and firm conviction

that the . . . [judge] made a clear error of judgment in the conclusion . . . [he] reached based on a weighing of the relevant factors." (Internal quotation marks omitted.) *See generally United States v. Houser, supra* (conclusive argument of error).

Turning to appellant's brief, we note that he does not aver that the military judge relied on an incorrect principle of law in deciding to admit the challenged hair-analysis evidence. *See generally United States v. Rouse*, 100 F.3d 560, 568 (8th Cir. 1996). In *United States v. Nimmer*, 43 MJ 252, we remanded the case for a hearing because the military judge did not have the benefit of the *Daubert* decision in determining that hair analysis was inadmissible. Here, individual defense counsel herself called the military judge's attention to the *Daubert* decision, and the military judge expressly referred to it in his written decision. Accordingly, our sole concern in this case is whether appellant has made a conclusive argument that the military judge made a clear error in this case. We are not so persuaded.

Appellant argues that the military judge made a clear error in judgment in determining from the evidence presented in this case that *Daubert* factors show reliable scientific knowledge was established in this case. He notes the *Daubert* factors and states: "[T]he expert testimony in the present case fails to meet the criteria of even one of these factors." Final Brief at 19. He then cites evidence of record supporting his arguments on the individual factors and concludes that a finding of reliability was not justified in this case.

In particular, appellant first contends that there was overwhelming evidence presented in this case that mass-spectrometry hair analysis was an untested procedure in detecting drug use. He also contends that there was insufficient evidence of peer review and publication because the only article reviewing the technique was written by the

FBI laboratory who performed the test. He also avers that there was no evidence admitted showing an error rate for the hair-analysis procedure performed in this case. Finally, he asserts that there was "insufficient and incomplete documentation of the procedures" (Final Brief at 31) of hair analysis used in this case.

The Government delineates in particular detail in its Answer to Final Brief the substantial evidence presented by the prosecution on each of the above *Daubert* factors. We agree with its reading of the record. Admittedly, there was disagreement between the experts presented by the parties with respect to some of the *Daubert* considerations. Nevertheless, we concur with the intermediate appellate court's conclusion that these disputes do not dictate that the evidence of hair analysis be excluded. It said:

That experts might dispute some particularities of the testing protocol or suggest ways that it could have been improved, or that different controls might be used, or that SOFT [Society of Forensic Toxicologists] might harbor policy concerns about the feasibility of hair analysis for workplace testing, or deem it prudent to have independent corroboration of hair analysis, [sic] even considered in the aggregate, are insufficient bases upon which to exclude the results. A vigorous forensic dialogue between both experts was aptly engaged before the triers of fact, who ultimately decided that Dr. Goldberger's reservations about and disagreements with Dr. Donnelly's conclusions were insufficient to raise a reasonable doubt that appellant had used cocaine. *Thomas*, 43 MJ [626,] at 633 [(A.F. Ct. Crim. App. 1995)]. Thus, we hold the military judge did not abuse his discretion in denying appellant's motion in limine and permitting qualitative and

quantitative analysis of appellant's hair to go before the court members.

44 MJ at 652 (footnote omitted). In these circumstances, we have no firm and definite conviction that the military judge erred in determining that the proffered hair-analysis evidence was reliable and relevant in appellant's case. (The detailed ruling of the military judge on admissibility is attached as an appendix.)

#### CONCLUSION

In summary, we conclude that the evidence of mass-spectrometry hair analysis proffered in this case was admissible because the hairs analyzed were lawfully seized from appellant with probable cause. *See Ornelas v. United States, supra* (probable cause should be practically, not technically applied). In addition, we conclude that the military judge did not abuse the discretion provided to him under Mil.R.Evid. 702, when based on the record before him, he admitted evidence of hair analysis in this case. *See generally United States v. Nimmer, 43 MJ 252 (CMA 1995)*. Such a decision is not unprecedented in Federal law. *See United States v. Medina, 749 F.Supp. 59 (E.D. NY 1990)*.

As a postscript, there is some irony to be noted in this case. For years, the military has used urinalysis to prove drug use. *See generally United States v. Ford, 23 MJ 331 (CMA 1987); United States v. Murphy, 23 MJ 310 (CMA 1987); United States v. Harper, 22 MJ 157 (CMA 1986)*. In this case, Staff Sergeant Bush thwarted a urinalysis by surreptitiously substituting a saline solution for a urine sample. The Government now has seized his hair and, by due process, proved drug use. This may be the first drug-use conviction by hair analysis, and it is ironic that Sergeant Bush had a hand in making the Government break new ground in drug detection to catch him.

The decision of the United States Air Force Court of Criminal Appeals is affirmed.

Chief Judge COX and Judges GIERKE and EFFRON concur.

DEPARTMENT OF THE AIR FORCE  
USAF TRIAL JUDICIARY, EASTERN CIRCUIT

UNITED STATES

v.

SSGT MICHAEL W. BUSH  
FR247-23-7903  
89th MEDICAL GROUP  
ANDREWS AFB, MD

SUPPLEMENT TO RULING ON MOTION IN LIMINE  
RE: HAIR ANALYSIS  
21 DECEMBER 1994

*BACKGROUND*

The defense made a motion in limine requesting the court to issue an order prohibiting the prosecution from introducing any testimony concerning the results of the hair analysis test conducted on hair samples taken from the body of the accused on 12 Jan 94. The issue before the court was whether the hair test employed by the Federal Bureau of Investigation is an inherently unreliable procedure for purposes of M.R.E. 702 and 403 analysis. During the trial, the Court denied the Defense motion. This analysis supplements the ruling at trial.

*FINDINGS OF FACT*

On or about 15 Nov 93, the accused provided a sample for urinalysis drug testing. The sample was later discovered to be a saline solution, and not urine. After AFOSI investigation, the AFOSI obtained search authority to seize about 100

samples of hair from the accused for testing for drugs. The accused's hair samples were sent to the Federal Bureau of Investigation for hair analysis drug testing and found to contain cocaine.

The DoD uses scientific testing methods at its laboratories for detecting cocaine in human fluid or tissue. The DoD uses radio immunoassay and then gas chromatography/ mass spectrometry. The gas chromatography (GC) identifies the substance, and the mass spectrometry (MS) quantifies the amount of the substance. These testing procedures have been in existence and accepted as reliable for criminal trials for many years.

The FBI uses the MS/MS equipment to test for cocaine. The MS/MS can be used instead of GC/MS, and has the advantages of increased sensitivity. Cocaine and its metabolites can be identified with MS/MS. The MS/MS was designed after and is more advanced than GC/MS machines.

The DoD has established an administrative cutoff for reporting urine samples positive. These administrative cutoffs are higher than what the testing equipment is capable of measuring. The FBI laboratory does not have an administrative cut-off higher than what the testing equipment is capable of measuring, rather, they attempt to identify and measure substances to the technical limits of the machine and operator.

Dr. Donnelly was qualified and accepted as an expert in forensic toxicology and hair analysis. He was the toxicologist who actually tested the accused's hair sample at the FBI Laboratory. His curriculum vitae is at App Ex XXII. He primarily works in the area of toxicology and forensic chemistry and works on hair analysis about 10-15 percent of his time in the lab. He has worked on hair analysis provided by the military, FBI, and other law enforcement agencies for criminal cases. He has testified about hair analysis in military,

federal, and state criminal courts. In all such court cases, he was qualified as an expert witness.

Dr. Donnelly is a member of a committee of the Society of Forensic Toxicology—as is the Defense expert, Dr. Goldberger—to study hair analysis. About June 1994, the committee stated their position that hair testing is a corroborative tool to confirm other evidence of drug abuse.

According to Dr. Donnelly, the committee agreed that such testing was ready to be used in forensic testing. Dr. Donnelly and his lab believe their test procedure can stand on its own and does not need corroboration.

The testing methodology was developed by the director of the chemical toxicology section of the FBI Laboratory, Roger Martz, and has been published and subject to peer review.

Appropriate chain of custody procedures are followed to insure the integrity of the hair sample. The samples are maintained in a secured facility.

Only one sample is tested at a time.

When ready for testing, the hair is briefly washed in methanol to insure removal of any exterior contaminates on the hair. The liquid, after washing, is later tested to see if any contaminates were on the exterior of the hair. This test helps insure that a positive drug test is not caused by external contamination. For the accused's test, the test of the liquid used for the wash showed no evidence of cocaine on the exterior of his hair.

The hair is then placed in another tube and mixed with hot acid to solubilize the drug out of the hair into an acid solution. The hair is extracted with dilute hydrochloric acid for one hour at a temperature of about 40–50 degrees centigrade. A precise amount of deuterated cocaine (introducing the hydrogen isotope that is twice the mass of

ordinary hydrogen that occurs in water), which acts as an internal standard, is added. After extraction with the acid solution, the supernatant is transferred to another tube and extracted for 20 minutes. The organic layer is then removed and dried under a stream of nitrogen, after which the residue is reconstituted with methanol and analyzed via direct probe chemical ionization tandem mass spectrometry. Identification of cocaine is accomplished when the daughter mass spectrum of molecular ion 304 m/z is identified. Quantification of the amount of cocaine is determined through the use of a second tandem mass spectrometric experiment known as the neutral loss of 122 m/z. If for any reason the sample under examination does not result in a full daughter spectrum of cocaine, or a perfect fingerprint, a cocaine identification is not made. The lab has no administrative cutoff level for determining a sample positive.

Under the conditions set for the test, only one chemical in the world will provide that same fragmentary pattern or fingerprint.

The MS/MS procedure has never given the FBI lab a false positive test result.

The lab does not do National Institute on Drug Abuse (NIDA) work and thus is not NIDA certified.

Only several other labs in the country have the MS/MS and perform hair drug analysis tests similar to the FBI, including the Navy and The National Institute of Justice in California.

Dr. Donnelly does not have an administrative cutoff level at which a result would automatically be considered negative. If the full spectrum or full fingerprint of the substance the laboratory is trying to identify is found, it is reported as positive, regardless of the quantity involved. If less than the full fingerprint is found, it is reported as negative.

Mass spectrometry has been available to scientists since the early 1980's. MS is used by drug companies as well as toxicology laboratories for drug identification and analysis. There are only several known laboratories in the United States which use MS/MS, as opposed to GC/MS, which is more widely and commonly used. MS/MS is not widely used, because the equipment is very expensive, about \$500,000 per machine, as compared to GC/MS, about \$50,000 per machine.

Dr. Goldberger, who testified for the defense, was also qualified and accepted as an expert in forensic toxicology and hair analysis. His lab uses the GC/MS procedure. He testified that he wished his lab could afford the top of the line MS/MS equipment. He stated that the MS/MS procedure is not the standard procedure, because most labs don't have that advanced equipment. He stated, "I've never replicated those procedures. I, unfortunately, don't have a MS/MS. . . . I believe that MS/MS is a very acceptable tool, and it's a fascinating tool for drug testing. And he's [Dr. Donnelly] lucky to have one." (ROT 168) Dr. Goldberger believed the MS/MS technique and science was reliable, but he disagreed with the application. (ROT 174, 178)

After hearing the testimony of Dr. Donnelly, it was "very obvious" to Dr. Goldberger how Dr. Donnelly calculated the cocaine concentrations in the accused's hair, even though he still felt Dr. Donnelly's procedure was unconventional. (ROT 170) He agreed that the testing done by Dr. Donnelly showed there was cocaine in the accused's hair. (ROT 179) He disputed the quantitative amount found by the test.

Cocaine was present in the accused's hair. The test only shows that cocaine is located somewhere along the shaft of a hair.

#### ***LEGAL STANDARDS AND ANALYSIS AND APPLICATION TO THE FACTS***

The Defense claims the hair analysis procedure offered into evidence is a fundamentally unreliable testing procedure to detect the use of cocaine, and Dr. Donnelly should not be permitted to testify about the hair test. Based on the above listed facts and following legal authorities, the Court finds the hair test is sufficiently reliable, and Dr. Donnelly's testimony is admissible. The hair test can show whether the accused has used a specific illegal drug—in this case cocaine—and a reasonably approximate time period of drug use.

Under the Federal Rules of Evidence, the trial judge must ensure that scientific testimony or evidence is both relevant and reliable before admission into evidence. *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 113 S.Ct. 2786 (1993). *Daubert*, at 2795, held also that "general acceptance" is not a necessary precondition to admission of scientific evidence under the Federal Rules of Evidence, stating that a "rigid 'general acceptance' requirement for admission of scientific evidence would be at odds with the 'liberal thrust' of the Federal Rules of Evidence and their general approach of relaxing traditional barriers to 'opinion' testimony."

Other courts have found hair testing a reliable procedure. In *U.S. v. Medina*, 749 F.Supp. 59 (E.D.N.Y. 1990), the Court admitted the results of radioimmunoassay (RIA) hair analysis to prove narcotics abuse. The Court found that such testing was sufficiently reliable and had obtained sufficient acceptance in the scientific community to be admissible as evidence. That Court also found that the testing of the hair was performed on a properly obtained sample, was performed using sound laboratory techniques, was performed carefully and accurately, and therefore, the test results were admissible to show that individual ingested narcotics. *Medina*, at 61, cited an extensive list of scientific writings showing RIA hair

analysis was accepted in the field of forensic toxicology when used to determine cocaine use. *Medina*, at 61, also found that although the application of the technique to detect controlled substances was fairly recent, "hair analysis has been used to detect the presence of metals or nutrients for almost twenty years."

Dr. Donnelly has been accepted and has testified as an expert about his lab's hair testing procedure in federal, military, and state criminal courts.

The extensive testimony by Dr. Donnelly and Dr. Goldberger, the Defense expert, shows MS/MS is a reliable scientific test. The Defense expert does not dispute that the test shows cocaine was in the hair sample of the accused; he readily agrees that cocaine was in the hair. The only real dispute about the test process is that Dr. Goldberger doesn't agree on the process to determine the exact quantity of cocaine in the hair.

The MS/MS testing equipment is more advanced and much more expensive than the standard, reliable RIA and GC/MS testing equipment. RIA and GC/MS testing have served as reliable and scientifically accepted testing methods for years to test for drugs in urine. Dr. Goldberger's concerns are that very few people have used MS/MS, as opposed to GC/MS, because of the cost of the machine. Therefore, a large number of scientists have been unable to use and evaluate it. However, he stresses he wishes his lab could afford MS/MS equipment and agrees that the scientific principles behind MS/MS are valid concepts.

The preponderance of the evidence clearly shows that MS/MS is a reliable, valid, and scientifically accepted testing method. This Court finds it sufficiently reliable that it can stand on its own to show whether an accused used cocaine. The Court finds no requirement that the MS/MS test may only

be admitted if supported by other evidence that corroborates the test—such as a positive urinalysis test.

The Court did not consider nor was influenced in this ruling by the information that the accused tested positive for cocaine on several urinalysis tests subsequent to the test of his hair. See ROT 57-58.

The testimony of Dr. Donnelly meets the requirements of M.R.E. 702, which allows testimony by experts if their specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue. See *U.S. v. Gipson*, 24 M.J. 246 (CMA 1987). His testimony addresses the critical issue of whether the accused used cocaine, and is certainly relevant under M.R.E. 401. The Court also finds that the probative value of the evidence outweighs the danger of prejudice under M.R.E. 403 and admitting the evidence will not overwhelm, confuse, or mislead the jury.

#### *DECISION*

The defense motion in limine is denied.

WILLIAM S. COLWELL, Colonel, USAF  
Military Judge

Appellate  
Exhibit LI

CRAWFORD, Judge (dissenting):

### FACTS

On November 15, 1993, appellant was selected to provide a urine specimen for a random drug-urinalysis test. After appellant provided the sample, the observer, Technical Sergeant Robichaud, noticed that the liquid was relatively clear. Nonetheless, the bottle was sent to the laboratory. On December 1, 1993, test results suggested that the sample was probably a saline solution. Because of the lapse of time, Office of Special Investigations (OSI) agents thought probable cause was lacking to request another urine sample. Special Agent (SA) David Toni interviewed appellant, who denied submitting a false urine sample. An interview with co-workers produced no evidence that appellant had taken illegal drugs.

As an alternative, SA Toni considered testing appellant's hair samples for drug residue, which could indicate appellant used drugs around November 15, 1993. When SA Toni talked to personnel at the FBI laboratory about hair samples, he was informed that hair grows approximately half an inch per month.

SA Toni then sought a search warrant from the base commander, Colonel Moore. On January 12, 1994, SA Toni submitted an affidavit to Col. Moore in order to obtain the hair sample. The affidavit stated that appellant worked in emergency medical services and had access to saline solution and a dispensing apparatus. Based on this information plus the information concerning the prior urinalysis test, the commander granted SA Toni permission to seize 100 hair samples from appellant's scalp. However, the affidavit made no mention of the amount hair grows per month.

At trial, Dr. Donnelly of the FBI Laboratory, who performed the hair analysis, testified that appellant's hair samples were approximately half an inch in length<sup>1</sup> and established that appellant had "consumed cocaine" because the hair contained 17 nanograms of cocaine per milligram of hair, and 2.7 nanograms of benzoylecgonine per milligram of hair. Appellant sought unsuccessfully to suppress the evidence concerning testing of the hair.

The defense argues that there could not be probable cause to search appellant's hair in January if hair grows half an inch per month. Thus, probable cause to make the seizure would only have existed between November 15 and December 15.

The Government argues that if the agent was incorrect in not informing the magistrate as to the rate of hair growth, the good-faith exception should be applied. The Government notes that the agents did not consider the hair-growth rate when they obtained the warrant.

### DISCUSSION

As with many constitutional issues, there is a fundamental structure to doctrinal analysis when examining Fourth Amendment issues. That analysis examines Fourth Amendment coverage<sup>2</sup> and protection.<sup>3</sup> Coverage exists when

<sup>1</sup>Although never precisely measured, there was a general consensus that appellant's hair was 'quite short,' and that the hairs measured approximately  $\frac{1}{2}$  inch in length." 44 MJ 646, 648 (1996).

<sup>2</sup>United States v. Taylor, 41 MJ 168, 170 (CMA 1994) ("Mil.R.Evid. 311 through 317, like the decisions of the Supreme Court, divide Fourth Amendment issues between coverage (that is, when the Fourth Amendment is applicable) and protections.")

In *United States v. Muniz*, 23 MJ 201, 206-07 (CMA 1987), then-Judge Cox wrote the following:

there is a right to privacy against government agents<sup>4</sup> using any of their senses or mechanical equipment to "observe"<sup>5</sup> areas that are normally considered "private"<sup>6</sup> or interfere with the freedom of movement of a person.<sup>7</sup> Taking blood from an

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The Fourth Amendment consists of two main components. The first part refers to the right of the people to be free of unreasonable searches. The second part discusses the circumstances under which warrants may issue. The interrelationship between the two parts has historically been expressed in terms such that searches without a valid warrant are unreasonable, unless they fall within one of the recognized exceptions to the warrant requirement; and the burden is on the Government to show that the search fits within an exception.

<sup>3</sup>In *United States v. Rivera*, 10 MJ 55, 57-58 (CMA 1980), the Court reiterated:

"[S]earches conducted outside the judicial process, without prior approval by judge or magistrate, are *per se* unreasonable under the Fourth Amendment—subject only to a few specifically established and well-delineated exceptions." *Katz v. United States*, 389 US 347, 357 [, 88 S.Ct. 507, 19 L.Ed.2d 576] (1967)(footnotes omitted). One well-recognized exception to the requirement that a magistrate or judicial officer must authorize certain searches is found in the military practice permitting commanding officers or their delegates to authorize searches upon probable cause.

<sup>4</sup>See Mil.R.Evid. 311(c), Manual for Courts-Martial, United States (1995 ed.).

<sup>5</sup>This term encompasses all five senses.

<sup>6</sup>There is a right to privacy when there is both a subjectively and an objectively reasonable expectation of privacy. *Katz v. United States*, 389 U.S. 347, 361 (1967) (Harlan, J. (concurring)).

<sup>7</sup>*United States v. Mendenhall*, 446 U.S. 544 (1980). "[A] person has been 'seized' within the meaning of the Fourth Amendment only if, in view of all of the circumstances surrounding the incident, a reasonable person would have believed that he was not free to leave." *Id.* at 554.

individual<sup>8</sup> or obtaining fingernail scrapings<sup>9</sup> constitutes a Fourth Amendment search. Once it is determined that coverage exists, the next issue is whether there was a violation of Fourth Amendment protections under the warrant requirement or under one of the specifically limited exceptions to the warrant requirement.<sup>10</sup>

The equivalent of a warrant in the military is an authorization by a commander.<sup>11</sup> Such authorization must satisfy the probable-cause<sup>12</sup> and specificity<sup>13</sup> requirements of the Fourth Amendment. The military, unlike some states, does not have a statute addressing how to obtain and identify physical characteristics of a suspect.<sup>14</sup> Thus, this Court must resort to general Fourth Amendment principles. To obtain hair samples from an individual requires reasonable grounds to believe that the hair would assist in a criminal prosecution.<sup>15</sup> The officer's actions may fill in any insufficiency in the authorization.<sup>16</sup> In this instance the search authorization did not designate whether the hair sample should be head hair, body hair, or genital hair. The officer's action will fill in the

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<sup>8</sup>*Schmerber v. California*, 384 U.S. 757 (1966).

<sup>9</sup>*Cupp v. Murphy*, 412 U.S. 291 (1973).

<sup>10</sup>*United States v. Morris*, 28 MJ 8, 15 (CMA 1989); *United States v. Rivera*, 10 MJ 55, 57 (CMA 1980); *see also* Mil.R.Evid. 315(g).

<sup>11</sup>Mil.R.Evid. 315(d)

<sup>12</sup>Mil.R.Evid. 315(f)

<sup>13</sup>Mil.R.Evid. 315(b)(1).

<sup>14</sup>See, e.g., § 13-3905, Ariz. Rev. Stat.; Vt.R.Crim.P. 41.1.

<sup>15</sup>Mil.R.Evid. 315(f)

<sup>16</sup>*United States v. Cunningham*, 113 F. 3d 289 (1st Cir. 1997)(holding officer's knowledge satisfied specificity requirement); *see United States v. Brown*, 49 F.3d 1162, 1169 (6th Cir. 1995) (holding that executing officer's knowledge "may cure" insufficiencies in warrant).

lack of specificity.<sup>17</sup> After the warrant was obtained, SA Toni focused on head hair. He asked Sergeant Carpenter to obtain approximately 100 hair samples from the crown of appellant's head.

In his affidavit, SA Toni did not tell Col. Moore that appellant's hair was short and that hair grew  $\frac{1}{2}$  inch per month. Hypothetically, let us consider that SA Toni was told by an informant that on November 15 Morgan had drugs in his house. In December, the same informant tells SA Toni that the drugs have been removed and sold. However, in January, when SA Toni seeks the search authorization from the commander, he does not tell the commander that the drugs were removed in December. It is not necessary for appellant to establish "by direct evidence that the affiant makes an omission recklessly. Rather, it is possible that when the facts omitted from the affidavit are clearly critical to a finding of probable cause, recklessness may be inferred from proof of the omission itself."<sup>18</sup> When there is a reckless omission by a law enforcement officer, the underlying information will be

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<sup>17</sup>See n. 15, *supra*.

<sup>18</sup>*Madiwale v. Savaiko*, 117 F.3d 1321, 1327 (11th Cir. 1997), quoting *United States v. Martin*, 615 F.2d 318, 329 (5th Cir. 1980)(holding that "[a] party need not show by direct evidence that the affiant makes an omission recklessly"); *United States v. McNeese*, 901 F.2d 585, 593, 594 (7th Cir. 1990) (citations omitted) (holding that one, by a preponderance of the evidence, "must offer direct evidence of the affiant's state of mind or inferential evidence that the affiant had obvious reasons for omitting facts in order to prove deliberate falsehood or reckless disregard"); *see also United States v. Colkley*, 899 F.2d 297, 301 (4th Cir. 1990). *Cf. United States v. Figueroa*, 35 MJ 54, 57 (CMA 1992) ("Even if the omission had been intentional or reckless, its inclusion would not have extinguished probable cause."); *but see United States v. Mankani*, 738 F.2d 538, 546 (2d Cir. 1984) (holding search warrant valid because there was "no direct evidence that omissions, if any, were intentionally or recklessly made").

reevaluated as if the correct information had been given.<sup>19</sup> Had that been done in this case, there would be no probable cause to seize hair from appellant's head on January 12, 1994.

Under the circumstances of this case, there were no grounds to believe that the 100 hair samples obtained from appellant's head would have any evidence that related to submission of a fraudulent urine sample on November 15, 1993.

The Government argues that SA Toni was a new agent and was on probationary status and had no training in obtaining hair analysis. The lack of training is not an excuse for failing to know what probable cause would mean in terms of obtaining hair samples.<sup>20</sup> For the good-faith exception to apply, "[a]t the very least, the officer must be familiar with well-established principles" of probable cause.<sup>21</sup> If one were to excuse SA Toni because of lack of training, such excuses would create incentive not to train officers and would undercut the right of privacy of all servicemembers.

For the reasons stated above, I dissent. I would reverse the decision of the Court of Criminal Appeals.

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<sup>19</sup>See *United States v. LaMorie*, 100 F.3d 547, 555 (8th Cir. 1996); *United States v. Kyllo*, 37 F.3d 526 (9th Cir. 1994); *see also Madiwale v. Savaiko*, 117 F.3d 1321 (11th Cir. 1997); *Martinez v. City of Schenectady*, 115 F.3d 111, 115 (2d Cir. 1997); *Sherwood v. Mulvihill*, 113 F.3d 396, 400 (3d Cir. 1997).

<sup>20</sup>*United States v. Lopez*, 35 MJ 35, 42 (CMA 1992).

<sup>21</sup>See n. 20, *supra*.